

WHAT IS CLAIMED:

1. A balloon catheter, comprising

a) an elongated shaft having a proximal end, a distal end, and at least one lumen; and

5 b) a balloon having a proximal and a distal skirt section secured to the shaft so that an interior of the balloon is in fluid communication with the at least one lumen of the shaft, and having a noninflated configuration, an inflated configuration, a working length section, a proximal tapered section having a proximal end at a distal end of the proximal skirt section and a distal end at a proximal end of the working length section, a distal tapered section having a proximal end at a distal end of the working length section and a distal end at a proximal end of the distal skirt section, a first layer formed of a first polymeric material, and a second layer formed of a second polymeric material different from the first polymeric material, the first and second layers extending from the proximal skirt section to the distal skirt section of the balloon, the second layer having a wall thickness, the wall thickness of the second layer along the working length section being greater than the wall thickness of the second layer along at least one of the proximal tapered section and the distal tapered section of the balloon from the proximal to the distal end of the tapered section in the noninflated configuration, so that the working length section defines a thickened wall portion of the balloon.

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2. The balloon catheter of claim 1 wherein the wall thickness of the second layer along the working length section is greater than the wall thickness of the second layer along both the proximal and the distal tapered sections from the proximal to the distal end of the tapered sections in the noninflated configuration.

3. The balloon catheter of claim 2 wherein the working length section has a cylindrical, uniform outer diameter from the proximal to the distal end of the working length section in the inflated configuration.

4. The balloon catheter of claim 1 wherein the wall thickness of the
5 second layer along the working length is greater than the wall thickness of the second layer along the proximal and distal skirt sections of the balloon in the noninflated configuration.

5. The balloon catheter of claim 4 wherein the wall thickness of the second layer along the working length is about 80% to about 120% greater than the
10 wall thickness of the second layer along the proximal skirt section in the noninflated configuration.

6. The balloon catheter of claim 1 wherein the second layer wall thickness is substantially uniform along the proximal tapered section in the noninflated configuration.

15 7. The balloon catheter of claim 1 the second layer wall thickness is substantially uniform along the distal tapered section in the noninflated configuration.

8. The balloon catheter of claim 1 wherein the second layer comprises a first sublayer formed of the second polymeric material, and a second sublayer
20 formed of the second polymeric material fused to an outer surface of the first sublayer along a central section of the first sublayer.

9. The balloon catheter of claim 1 wherein the second layer is an inner layer relative to the first layer.

10. The balloon catheter of claim 1 wherein the first layer is a porous polymeric material selected from the group consisting of expanded
5 polytetrafluoroethylene, ultra high molecular weight polyolefin, ultra high molecular weight polyethylene, porous polyethylene, porous polypropylene, and porous polyurethane.

11. The balloon catheter of claim 1 wherein the second layer is formed of a single polymeric material along the entire length and width of the second layer.

10 12. The balloon catheter of claim 1 wherein the balloon catheter is a stent delivery catheter system, and including a stent mounted on the working length section of the balloon in the noninflated configuration with a proximal and a distal end of the stent located on the thickened wall portion of the balloon.

13. A balloon catheter, comprising:

15 a) an elongated shaft having a proximal end, a distal end, and at least one lumen; and

b) a balloon having a proximal and a distal skirt section secured to the shaft so that an interior of the balloon is in fluid communication with the at least one lumen of the shaft, and having a noninflated configuration, an inflated
20 configuration, a working length section, a proximal tapered section having a proximal end at a distal end of the proximal skirt section and a distal end at a proximal end of the working length section, a distal tapered section having a proximal end at a distal end of the working length section and a distal end at a

proximal end of the distal skirt section, a first layer formed of a porous polymeric material, and a second layer formed of an elastomeric polymeric material different from the porous polymeric material, the first and second layers extending from the proximal to the distal skirt sections of the balloon, the second layer having a wall thickness, the wall thickness of the second layer along the working length section being greater than the wall thickness of the second layer along the proximal and distal skirt sections in the noninflated configuration, so that the working length section defines a thickened wall portion of the balloon.

14. The balloon catheter of claim 13 wherein the wall thickness of the second layer along the working length section is greater than the wall thickness of the second layer along the proximal tapered section and the distal tapered section of the balloon from the proximal to the distal end of the tapered sections in the noninflated configuration.

15. A method of making a balloon catheter having a balloon with a proximal and distal skirt section sealingly secured to an elongated catheter shaft, a working length section, a proximal tapered section having a proximal end at a distal end of the proximal skirt section and a distal end at a proximal end of the working length section, and a distal tapered section having a proximal end at a distal end of the working length section and a distal end at a proximal end of the distal skirt section, comprising:

a) securing a balloon first layer formed of a first polymeric material to a balloon second layer formed of a second polymeric material, the second layer comprising a first sublayer formed of the second polymeric material fused to a central section of a second sublayer formed of the second polymeric material, so that a wall thickness of the second layer along the central working length section of the balloon is greater than the wall thickness of the second layer

along at least one of the proximal tapered sections and the distal tapered section of the balloon from the proximal to the distal end of the tapered section in a noninflated configuration of the balloon, so that the central working length section of the balloon defines a thickened wall portion of the balloon; and

- 5 b) securing the proximal skirt section and the distal skirt section of the balloon to an elongated catheter shaft so that an interior of the balloon is in fluid communication with a lumen of the shaft.

16. The method of claim 15 wherein a) comprises heating the first and second sublayers with the first layer of the balloon positioned therearound, to
10 thereby fuse the first and second sublayers together to form the second layer of the balloon, and to fuse the second layer of the balloon to the first layer of the balloon.

17. The method of claim 15 wherein the proximal skirt section and the distal skirt section of the balloon are secured to the elongated catheter shaft before the first and second sublayers are fused together and before the first and second
15 layers of the balloon are secured together.